# Triangles

**Expected learning outcome**:

- Criteria for similar triangles.
- Highlight of the core concept and major areas: SAS~, AA~, AAA~ criterion
- Application of Basic Proportionality Theorem

**ASSERTION REASON**

**DIRECTIONS:** Select the correct answer to these questions from the codes a, b, c and d as given below:

a) Both Assertion (A) and Reason (R) are true, and R is the correct explanation for A

b) Both Assertion (A) and Reason(R) are true, but R is not the correct explanation for A

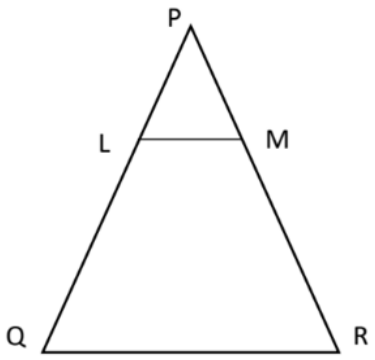
c) Assertion(A) is true, but Reason (R) is false

d) Assertion (A) is false, but Reason(R) is true

Q1. Assertion (A) P and Q are points on sides AB and AC of $\Delta ABC$ such that AP = 2a, PB = 6a, AQ = b and QC = 3b then PQ||BC

Reason (R): By converse of BPT if $\frac{AP}{PB} = \frac{AQ}{QC}$ then PQ||BC

Q2. Assertion:




In the given figure, LM//QR and PL:LQ=1:3. Then $\frac{PM}{PR} = \frac{1}{4}$.

Reasoning:

If a line is drawn parallel to one side of a triangle to intersect the other 2 sides in distinct points, the other 2 sides are divided in the same ratio.

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**MCQ'S**

**Q3.** The perimeters of two similar triangles ABC and PQR are 32cm and 24cm respectively. If PQ=12cm, then the length of AB is

a) 8cm b) 9cm c)16cm d) 20cm

**Q4.** In ∆ABC, DE∥BC, AD=2cm and DB=3cm then DE: BC is

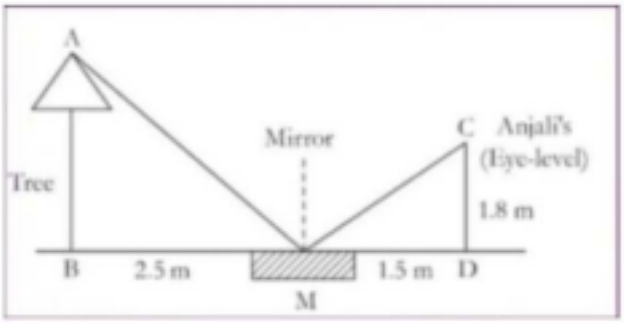
a) 2:3 b) 2:5 c) 1:2 d) 3:5

**Q5.** In an equilateral ∆ABC, G is the centroid. Each side of the triangle is 6cm. The length of AG is:

a) 2√2cm b) 3√2cm c) 2√3cm d) 3√3cm

**CASE STUDY**

**Q6**. Teacher gives an activity to the students to measure the height of the tree and asks them who will do this activity. Anjali accepts the challenge, and he places a mirror on level ground to determine the height of the tree. She stands at a certain distance so that she can see the top of the tree reflected from the mirror. Anjali's eye level is 1.8m above ground. The distance of Anjali and the tree from the mirror are 1.5m and 2.5m respectively.




a) State the criterion of similarity that is applicable here.

b) Find the height of the tree

c) If triangle ABM and triangle CDM are similar, CD=6cm, MD=8cm and BM=24cm, then AB =?

**Q7.** Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house is 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.

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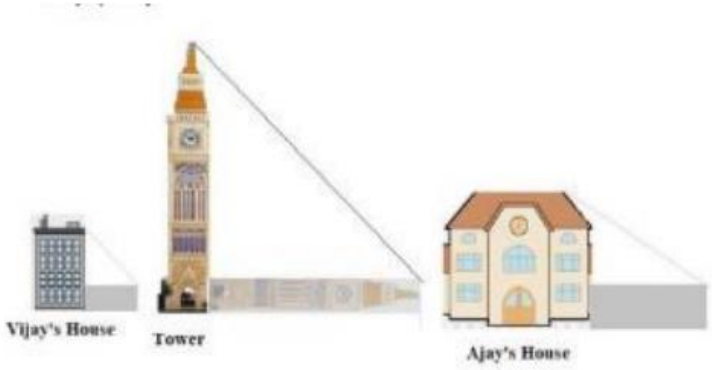



a) What is the height of the tower?

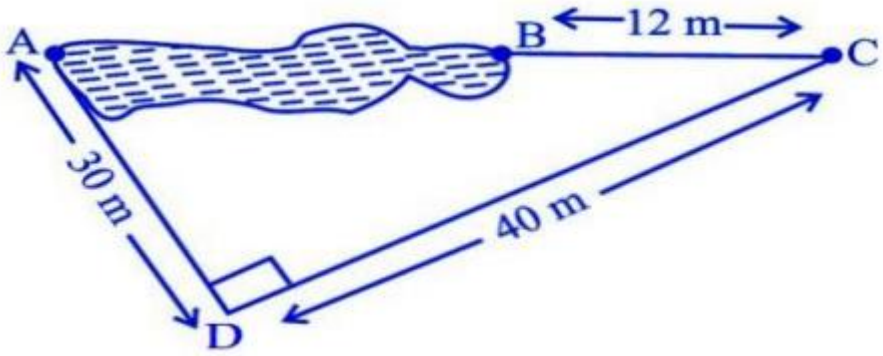
b) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m?

c) When the tower casts a shadow of 40m, same time what will be the length of the shadow of Ajay's house?

OR

When the tower casts a shadow of 40m, same time what will be the length of the shadow of Vijay's house?

Q8. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D to the point A which is are a distance of 30m from D such the ADC=90◦ .




a) Which property of geometry will be used to find the distance AC?
b) What is the distance AC?
c) Find the length of the rope used.

OR

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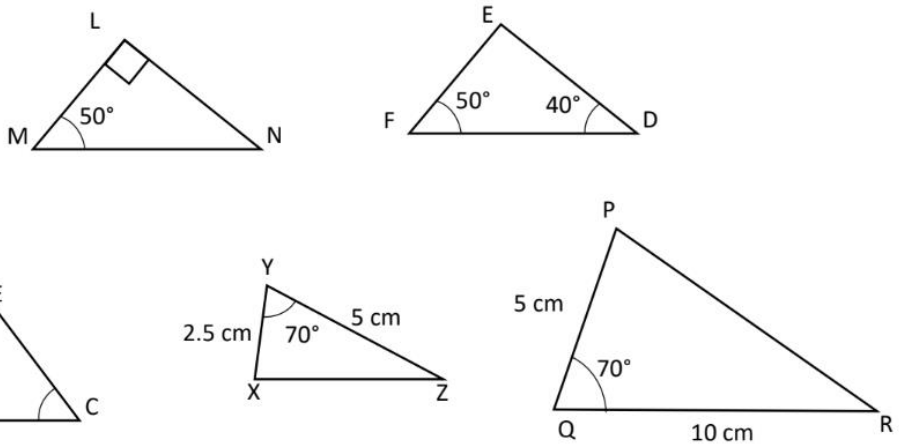
Find the length of AB ?

Q9. Children of class 10 were asked to identify similar triangles from a given set of triangles.




i. ΔLMN & ΔEFD are similar by which criterion?
ii. Identify 2 similar triangles with SAS~.
iii. Which all are similar by AA~ similarity criterion?

**ANSWER KEY**

**Q1. A)**

**Q2. A)**

**Q3.** c) 16cm

Q4. d) 3:5

Q5. c) $2\sqrt{3}$cm

**Q6.** a) AA b) 3m c) 18cm

Q7. a)100 m b) 60 m c) 16 m O R 8m

Q8. a) Pythagoras theorem b) 50 m c) 82 m OR 38 m

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